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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/777,538 | 02/11/2004 | Hardayal Singh Gill | HSJ9-2003-0254US1 | 5151 |
| 32112 | 7590 | 11/15/2006 | EXAMINER | |
| INTELLECTUAL PROPERTY LAW OFFICES 1901 S. BASCOM AVENUE, SUITE 660 CAMPBELL, CA 95008 | | | BLOUIN, MARK S | |
| | | | ART UNIT | PAPER NUMBER |

2627

DATE MAILED: 11/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/777,538

Applicant(s)

GILL, HARDAYAL SINGH

Examiner

Mark Blouin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Detailed Action

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 24, 2006 has been entered.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freitag et al (USPub 2005/0122635) in view of Li et al (USPN 6,909,583).

3. Regarding Claims 1, 10, and 19, Freitag et al shows (Fig. 10), a disk drive comprising at least one hard disk, at least one magnetic head adapted to fly over the hard disk for writing data on the hard disk, and having an air bearing surface, the magnetic head including a read sensor including a free layer (202); a spacer layer (206); a plurality of self-pinned layers (220, 222) of ferromagnetic material and non-magnetic material, wherein the non-magnetic metal of the plurality of layers is chosen from a group

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consisting of Ru (224), Cr, Ir, Cu (208), Rh, and Re, but does not show interleaved layers of ferromagnetic metal and non-magnetic metal.

Li et al shows interleaved layers (AP1,15) of ferromagnetic metal and non-magnetic metal.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the self- pinned layers of Freitag et al with the interleaved layers as taught by Li et al. The rationale is as follows: One of ordinary skill in the art at the time the invention was made would have been motivated to replace the self- pinned layers of Freitag et al with the interleaved layers as taught by Li et al to provide good pinning strength thus inhibiting amplitude flip.

4. Regarding Claims 2 and 11, Freitag et al shows (Fig. 10), the magnetic head, wherein the plurality of self-pinned layers includes AP1 (220) and AP2 (222), where AP1 (220) includes an odd number of layers of ferromagnetic material (CoPtCr).

5. Regarding Claims 3,12, and 20, Freitag et al shows (Fig. 10), the magnetic head, wherein the AP1 and the AP2 together have a net magnetic moment $dM=0$ (equal and opposite).

6. Regarding Claims 4,13, and 21, Freitag et al shows (Fig. 10), the magnetic head, wherein the $dM=0$ corresponds to a dT less than 5×10^{-10} meters, where magnetic thickness $T=M \times t$, and M equals magnetization, t equals thickness of material, and dT is the differential in the layer thicknesses (inherent).

7. Regarding Claims 5,14, and 22, Freitag et al shows (Fig. 11), the magnetic head, wherein the plurality of self-pinned layers has $H_k > 200$ Oe.

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8. Regarding Claims 6,15, and 23, Freitag et al shows [0009], the magnetic head, wherein the plurality of self-pinned layers is pinned by magnetostrictive anisotropy.

9. Regarding Claims 7 and 16, Freitag et al shows (Fig. 10), the magnetic head, wherein the ferromagnetic material of the plurality of self-pinned layers is chosen from group consisting of CoFe, CoFe/NiFe, and Fe.

10. Regarding Claims 8 and 17, Freitag et al shows (Fig. 10), the magnetic head, wherein the non-magnetic metal of the plurality of self-pinned layers is chosen from a group consisting of Ru, Cr, Ir, Cu, Rh, and Re.

11. Regarding Claims 9 and 18, Freitag et al shows [0042], the magnetic head, wherein the read sensor is of Current Perpendicular to the Plane (CPP) configuration.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Blouin whose telephone number is 571-272-7583. The examiner can normally be reached on M-F from 6:00 to 3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Nguyen, can be reached on 571-272-7579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you

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have questions on access to the Private PAIR system, contact the Electronic Business

Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Mark Blouin', with a long horizontal stroke extending to the right.

Mark Blouin

Patent Examiner

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November 8, 2006